Index to Volume 112

No. 1

Part 1

George Hevesy Medal 1986 5

R. E. Wainerdi
Professor Emile A. Schweikert presented with the Hevesy Medal for 1986 7

K. Heydorn
Preface 9

Programme Committee and Session Chairmen 10

Recent Developments

P. Englert, J. Brückner, H. Wänke (San Jose, CA, USA and Mainz, FRG)
Planetary gamma-ray spectroscopy, a special form of prompt charged particle and prompt neutron activation analysis 11

G. Wauters, C. Vandecasteele, K. Strijckmans, J. Hoste (Gent, Belgium)
Determination of cadmium, thallium and lead in environmental samples by proton activation analysis 23

R. G. Downing, J. T. Maki, R. F. Fleming (Gaithersburg, Maryland, USA)
Analytical applications of neutron depth profiling 33

T. Nozaki, Y. Itoh, S. Hayashi, Q. Qiu (Wako-shi Saitama, Japan)
Utilization of deuterium and ^{15}N as activable tracers in solid state sciences 47

N. M. Spyrou, Kusminarto, G. E. Nicolaou (Guildford, Surrey, UK)
2-D reconstruction of elemental distribution within a sample using neutron capture prompt gamma-rays 57

T. B. Pierce, J. Huddleston, I. G. Hutchinson (Oxon, UK)
Application of tomographic techniques to an investigation of elemental distributions following neutron irradiations 65

W. D. Ehmann, R. C. Young, III, D. W. Koppenaal, W. C. Jones, M. N. Prasad (Lexington, Kentucky, USA)
Derivative techniques in activation analysis 71

W. D. Frasch, J. Larsen, N. Bowlby, I. Apel, J. D. Jones (Ann Arbor, MI, USA)
A technique for the determination of protein concentration by neutron activation analysis of silver binding 89

S. F. Stone, D. Hancock, R. Zeisler (Gaithersburg, MD, USA)
Characterization of biological macromolecules by electrophoresis and neutron activation 95

E. Sabbioni, R. Pietra, J. Edel, L. Goetz (Ispra, Italy)
The role of neutron activation analysis and radioanalytical methods in dose-effect relationship studies for the setting of trace metal protection criteria 109

Sample Preparation

J. Stary (Prague, Czechoslovakia)
Rapid separation of mercury, arsenic, thallium and chromium species 119

M. Gallorini, E. Orvini, L. Goetz, R. Pietra, E. Sabbioni (Pavia and Ispra, Italy)
Arsenic speciation in solid biological specimens by temperature-controlled pyrolysis and NAA 125

C. Y. Wu, P. Y. Chen, M. H. Yang (Taiwan, Republic of China)
Simultaneous determination of arsenic, mercury, antimony and selenium in biological materials with prior collection of gaseous products followed by neutron activation analysis 133

R. Cornelis (Gent, Belgium)
Sample handling of clinical specimens for ultratrace element analysis 141

G. V. Iyengar (Gaithersburg, MD, USA)
Sample validity in biological trace element and organic nutrient research studies 151

F. Lux, T. Bereznai, S. Trebert Haeberlin (Garching, FRG)
Minimization of the blank values in the neutron activation analysis of biological samples considering the whole procedure 161

B. Salbu (Oslo, Norway)
Size fractionation techniques combined with INAA for speciation purposes 169

J. S. Petersen (Arhus, Denmark)
Multielement analysis of purified mineral separates: a study of intermineral partitioning in differentiated silicate melts 175

K. S. Huang, G. S. Zhuang, Y. D. Cheng (Beijing and Shanghai, The People's Republic of China)
Neutron activation analysis of some noble metals with preconcentration procedure using a new type of cation chelating resin 193

Information Processing and Control

M. de Bruin, P. M. van Wijk, R. van Assema, C. de Roos (Delft, The Netherlands)
The use of multi-element concentration datasets obtained by INAA in the identification of sources of environmental pollutants 199

Ph. K. Hopke, R. C. Martin, M. A. Evins (Urbana and Chicago, IL, USA)
The interpretation of multielemental INAA data using pattern recognition methods 215

H. S. Hsia, V. P. Guinn (Irvine, CA, USA)
New forms of the INAA advance prediction computer program 223

I. Obrusník, K. Eckschlager (Řež, Czechoslovakia)
Optimization of information properties of NAA with respect to information content and profitability of results 233

T. G. Pringle, R. E. Jervis (Toronto, Canada)
A particle-size specific elemental mass balance for the apportionment of ambient aerosol 243

T. Takeuchi, Y. Nakano, A. Aoki, S. Ohmori, T. Tsukatani (Osaka, Japan)
Comparisons of elemental concentrations in hair of the inhabitants of heavy metal polluted areas with those of normal Japanese 259

Definitions and Terms 273

No. 2

Activation Techniques

M. Al-Mugrabi, N. M. Spyrou (Guildford, Surrey, UK)
The determination of uranium using short-lived fission products by cyclic and other modes of activation analysis 277

B. Anders, U. Behrens, H. Brückmann, U. Schröder, W. Vogel (Hamburg, FRG)
Methods of element analysis by the use of charged particles from the Hamburg Isochronous Cyclotron 285

F. Chisela, D. Gawlik, P. Bratter (Berlin)
Advantages of boron filters in instrumental epithermal neutron activation analysis of biological materials 293

D. Gawlik, K. Berthold, F. Chisela, P. Bratter (Berlin)
The application of NAA with irradiation at reduced temperature for the study of element losses during pretreatment of biological samples 309

R. M. Lindstrom, R. Zeisler, M. Rossbach (Gaithersburg, MD, USA and Jülich, FRG)
Activation analysis opportunities using cold neutron beams 321

M. Spychala, W. Michaelis, H.-U. Fanger (Geesthacht, FRG)
Prompt gamma-ray neutron activation analysis for multi-element determination in sediment samples 331

W. B. Stroube, Jr., W. C. Cunningham, G. J. Lutz (Washington, DC and Gaithersburg, MD, USA)
Analysis of foods for iodine by epithermal neutron activation analysis 341

F. Grass (Wien, Austria)
Short-time activation analysis with steady-state and pulse irradiation 347

W. D. James (College Station, TX, USA)
Evaluation of reactor pulsing activation analysis enhancement in reference materials 361

P. Bode, M. de Bruin (Delft, The Netherlands)
The use of carbon fiber for the irradiation position of a fast-rabbit system 375

S. J. Parry (Ascot, Berkshire, UK)
Cumulative neutron activation of short-lived radionuclides for the analyis of large samples in mineral exploration 383

Light Elements

I. M. Cohen, C. Magnavacca, G. B. Baró (Buenos Aires, Argentina)
Determination of lithium by reactor activation analysis using the reactor chain: ^{6}Li(n, t)^{4}He; ^{32}S(t, n)^{34m}Cl 387

M. Fedoroff, V. V. Samosyuk, J. C. Rouchaud, C. Loos-Neskovic (Vitry, France, Moscow, USSR and Gif-sur-Yvette, France)
Determination of nitrogen in solids by photon and reactor neutron activation 395

C. Friedli, Th. Diaco, P. Lerch (Lausanne, Switzerland)
Lithium and beryllium trace determination using heavy-ion activation analysis 403

H. Fukushima, T. Kimura, H. Hamaguchi, T. Nozaki, Y. Itoh, Y. Ohkubo (Chiba and Saitama, Japan)
Routine determination of light elements by charged-particle activation analysis 415

J. W. Mitchell, S. Yegnasubramanian, L. Shepherd (Murray Hill, New Jersey, USA and Bombay, India)
Nitrogen distribution in polymers determined by proton track counting and 14 MeV neutron activation analysis 425

R. Pepelnik (Geesthacht, FRG)
Capability of the 14 MeV neutron activation analysis at $3 \cdot 10^{10}$ n · cm^{-2} · s^{-1} with respect to sensitivities and interferences of all useful reactions 435

I. Roelandts, G. Robaye, G. Weber, J. M. Delbrouck, J. C. Duchesne (Sart Tilman, Belgium)
Determination of fluorine by proton-induced gamma-ray emission (PIGE) spectrometry in igneous and metamorphic charnockitic rocks from Rogaland (S. W. Norway) 453

Rare Earths

J. C. Laul, E. A. Lepel (Richland, Washington, USA)
Rare earth element patterns in biotite, muscovite, and tourmaline minerals 461

P. Collecchi, M. Esposito, S. Meloni, M. Oddone (Genova and Pavia, Italy)
Rare-earth element abundance in tissues and plasma of healthy subjects and patients by neutron activation analysis 473

C. Koeberl, F. Kluger, W. Kiesl (Vienna, Austria)
Rare earth element determinations at ultratrace abundance levels in geologic materials 481

M. Koyama, M. Shirakawa, J. Takada, Y. Katayama, T. Matsubara (Osaka, Japan)
Trace elements in land plants: concentration ranges and accumulators of rare earths, Ba, Ra, Mn, Fe, Co, and heavy halogens 489

S. Meloni, N. Genova, M. Oddone, F. Oliveri, R. Vannucci (Pavia and Urbino, Italy)
Rare-earth elements abundance and distribution in pelagic sediments by instrumental neutron activation analysis 507

M. L. Peterson, L. Tobler, A. Wyttenbach (Wuerenlingen, Switzerland)
Rare earth element phase distributions in a deep-sea carbonate sediment 515

I. Roelandts, C. L. V. Monty (Liège, Belgium)
Rare-earth elements in recent calcareous benthic organisms 531

H.-G. Stosch, U. Herpers, J. Kötz (Köln, FRG)
Neutron activation analysis of the rare earth elements in rocks from the earth's upper mantle and deep crust 545

N. Suzuki, K. Miura, S. Nakamura (Sendai, Japan)
Substoichiometric radioactivation analysis for ytterbium 555

Definitions and Terms 563

Index to Volume 112 567

571

Author Index to Volume 112

AL-MUGRABI, M., SPYROU, N. M.: The determination of uranium using short-lived fission products by cyclic and other modes of activation analysis, 277

ANDERS, B., BEHRENS, U., BRÜCKMANN, H., SCHRÖDER, U., VOGEL, W.: Methods of element analysis by the use of charged particles from the Hamburg Isochronous Cyclotron, 285

AOKI, A., *see* TAKEUCHI, T., 259

APEL, I., *see* FRASCH, W. D., 89

ASSEMA, VAN, R., *see* VAN ASSEMA, R., 199

BARÓ, G. B., *see* COHEN, I. M., 387

BEHRENS, U., *see* ANDERS, B., 285

BEREZNAI, T., *see* LUX, F., 161

BERTHOLD, K., *see* GAWLIK, D., 309

BODE, P., DE BRUIN, M.: The use of carbon fiber for the irradiation position of a fast-rabbit system, 375

BOWLBY, N., *see* FRASCH, W. D., 89

BRÄTTER, P., *see* CHISELA, F., 293

BRÄTTER, P., *see* GAWLIK, D., 309

BRÜCKMANN, H., *see* ANDERS, B., 285

BRÜCKNER, J., *see* ENGLERT, P., 11

BRUIN, DE, M., *see* DE BRUIN, M., 199, 375

CHEN, P. Y., *see* WU, C. Y., 133

CHENG, Y. D., *see* HUANG, K. S., 193

CHISELA, F., GAWLIK, D., BRÄTTER, P.: Advantages of boron filters in instrumental epithermal neutron activation analysis of biological materials, 293

CHISELA, F., *see* GAWLIK, D., 309

COHEN, I. M., MAGNAVACCA, C., BARÓ, G. B.: Determination of lithium by reactor activation analysis using the reactor chain: $^{6}Li(n, t)^{4}He; ^{32}S(t, n)^{34m}Cl$, 387

COLLECCHI, P., ESPOSITO, M., MELONI, S., ODDONE, M.: Rare-earth element abundance in tissues and plasma of healthy subjects and patients by NAA, 473

CORNELIS, R.: Sample handling of clinical specimens for ultratrace element analysis, 141

CUNNINGHAM, W. C., *see* STROUBE, W. B., Jr., 341

DE BRUIN, M., VAN WIJK, P. M., VAN ASSEMA, R., DE ROOS, C.: The use of multi-element concentration datasets obtained by INAA in the identification of sources of environmental pollutants, 199

DE BRUIN, M., *see* BODE, P., 375

DELBROUCK, J. M., *see* ROELANDTS, I., 453

DE ROOS, C., *see* DE BRUIN, M., 199

DIACO, Th., *see* FRIEDLI, C., 403

AUTHOR INDEX

DOWNING, R. G., MAKI, J. T., FLEMING, R. F.: Analytical applications of neutron depth profiling, 33

DUCHESNE, J. C., *see* ROELANDTS, I., 453

ECKSCHLAGER, K., *see* OBRUSNÍK, I., 233

EDEL, J., *see* SABBIONI, E., 109

EHMANN, W. D., YOUNG, R. C., III, KOPPENAAL, D. W., JONES, W. C., PRASAD, M. N.: Derivative techniques in activation analysis, 71

ENGLERT, P., BRÜCKNER, J., WÄNKE, H.: Planetary gamma-ray spectroscopy, a special form of prompt charged particle and prompt neutron activation analysis, 11

ESPOSITIO, M., *see* COLLECCHI, P., 473

EVINS, M. A., *see* HOPKE, Ph. K., 215

FANGER, H.-U., *see* SPYCHALA, M., 331

FEDOROFF, M., SAMOSYUK, V. N., ROUCHAUD, J. C., LOOS-NESKOVIC, C.: Determination of nitrogen in solids by photon and reactor neutron activation, 395

FLEMING, R. F., *see* DOWNING, R. G., 33

FRASCH, W. D., LARSEN, J., BOWLBY, N., APEL, I., JONES, J. D.: A technique for the determination of protein concentration by NAA of silver binding, 89

FRIEDLI, C., DIACO, Th., LERCH, P.: Lithium and beryllium trace determination using heavy-ion activation analysis, 403

FUKUSHIMA, H., KIMURA, T., HAMAGUCHI, H., NOZAKI, T., ITOH, Y., OHKUBO, Y.: Routine determination of light elements by charged-particle activation analysis, 415

GALLORINI, M., ORVINI, E., GOETZ, L., SABBIONI, E.: Arsenic speciation in solid biological specimens by temperature-controlled pyrolysis and NAA, 125

GAWLIK, D., BERTHOLD, K., CHISELA, F., BRÄTTER, P.: The application of NAA with irradiation at reduced temperature for the study of element losses during pretreatment of biological samples, 309

GAWLIK, D., *see* CHISELA, F., 293

GENOVA, N., *see* MELONI, S., 507

GOETZ, L., *see* GALLORINI, M., 125

GOETZ, L., *see* SABBIONI, E., 109

GRASS, F.: Short-time activation analysis with steady-state and pulse irradiation, 347

GUINN, V. P., *see* HSIA, H. S., 223

HAMAGUCHI, H., *see* FUKUSHIMA, H., 415

HANCOCK, D., *see* STONE, S. F., 95

HAYASHI, S., *see* NOZAKI, T., 47

HERPERS, U., *see* STOSCH, H.-G., 545

HEYDORN, K.: Preface, 9

HOPKE, Ph. K., MARTIN, R. C., EVINS, M. A.: The interpretation of multielemental INAA advance prediction computer program, 223

HOSTE, J., *see* WAUTERS, G., 23

HSIA, H. S., GUINN, V. P.: New forms of the INAA data using pattern recognition methods, 215

HUANG, K. S., ZHUANG, G. S., CHENG, Y. D.: NAA of some noble metals with preconcentration procedure using a new type of cation chelating resin, 193

HUDDLESTON, J., *see* PIERCE, T. B., 65

HUTCHINSON, I. G., *see* PIERCE, T. B., 65

ITOH, Y., *see* FUKUSHIMA, H., 415

ITOH, Y., *see* NOZAKI, T., 47

IYENGAR, G. V.: Sample validity in biological trace element and organic nutrient research studies, 151

JAMES, W. D.: Evaluation of reactor pulsing activation analysis enhancement in reference materials, 361

JERVIS, R. E., *see* PRINGLE, T. G., 243

JONES, J. D., *see* FRASCH, W. D., 89

JONES, W. C., *see* EHMANN, W. D., 71

KATAYAMA, Y., *see* KOYAMA, M., 489

KIESL, W., *see* KOEBERL, C., 481

KIMURA, T., *see* FUKUSHIMA, H., 415

KLUGER, F., *see* KOEBERL, C., 481

KOEBERL, C., KLUGER, F., KIESL, W.: Rare earth element determinations at ultratrace abundance levels in geologic materials, 481

KOPPENAAL, D. W., *see* EHMANN, W. D., 71

KÖTZ, J., *see* STOSCH, H.-G., 545

KOYAMA, M., SHIRAKAWA, M., TAKADA, J., KATAYAMA, Y., MATSUBARA, T.: Trace elements in land plants: concentration ranges and accumulators of rare earths, Ba, Ra, Mn, Fe, Co, and heavy halogens, 489

KUSMINARTO, *see* SPYROU, N. M., 57

LARSEN, J., *see* FRASCH, W. D., 89

LAUL, J. C., LEPEL, E. A.: Rare earth element patterns in biotite, muscovite and tourmaline minerals, 461

LEPEL, E. A., *see* LAUL, J. C., 461

LERCH, P., *see* FRIEDLI, C., 403

LINDSTROM, R. M., ZEISLER, R., ROSSBACH, M.: Activation analysis opportunities using cold neutron beams, 321

LOOS-NESKOVIC, C., *see* FEDOROFF, M., 395

LUTZ, G. J., *see* STROUBE, W. B., Jr., 341

LUX, F., BEREZNAI, T., TREBERT HAEBERLIN, S.: Minimization of the blank values in the NAA of biological samples considering the whole procedure, 161

MAGNAVACCA, C., *see* COHEN, I. M., 387

MAKI, J. T., *see* DOWNING, R. G., 33

MARTIN, R. C., HOPKE, Ph. K., 215

MATSUBARA, T., *see* KOYAMA, M., 489

MELONI, S., GENOVA, N., ODDONE, M., OLIVERI, F., VANNUCCI, R.: Rare-earth elements abundance and distribution in pelagic sediments by INAA, 507

MELONI, S., *see* COLLECCHI, P., 473

MICHAELIS, W., *see* SPYCHALA, M.: 331

MITCHELL, J. W., YEGNASUBRAMANIAN, S., SHEPHERD, L.: Nitrogen distribution in polymers determined by proton track counting and 14 MeV NAA, 425

MIURA, K., *see* SUZUKI, N., 555

MONTY, C. L. V., *see* ROELANDTS, I., 531

NAKAMURA, S., *see* SUZUKI, N., 555

NAKANO, Y., *see* TAKEUCHI, T., 259

NICOLAOU, G. E., *see* SPYROU, N. M., 57

NOZAKI, T., ITOH, Y., HAYASHI, S., QIU, Q.: Utilization of deuterium and ^{15}N as activable tracers in solid state sciences, 47

NOZAKI, T., *see* FUKUSHIMA, H., 415

AUTHOR INDEX

OBRUSNÍK, I., ECKSCHLAGER, K.: Optimization of information properties of NAA with respect to information content and profitability of results, 233

ODDONE, M., *see* COLLECCHI, P., 473

ODDONE, M., *see* MELONI, S., 507

OHKUBO, Y., *see* FUKUSHIMA, H., 415

OHMORI, S., *see* TAKEUCHI, T., 259

OLIVERI, F., *see* MELONI, S., 507

ORVINI, E., *see* GALLORINI, M., 125

PARRY, S. J.: Cumulative neutron activation of short-lived radionuclides for the analysis of large samples in mineral exploration, 383

PEPELNIK, R.: Capability of the 14 MeV NAA at $3 \cdot 10^{9}$ $n \cdot cm^{-2} \cdot s^{-1}$ with respect to sensitivities and interferences of all usefull reactions, 435

PETERSEN, J. S.: Multielement analysis of purified mineral separates: a study of intermineral partitioning in differentiated silicate melts, 175

PETERSON, M. L., TOBLER, L., WYTTENBACH, A.: Rare earth element phase distributions in a deep-sea carbonate sediment, 515

PIERCE, T. B., HUDDLESTON, J., HUTCHINSON, I. G.: Application of tomographic techniques to an investigation of elemental distributions following neutron irradiations, 65

PIETRA, R., *see* SABBIONI, E., 109

PRASAD, M. N., *see* EHMANN, W. D., 71

PRINGLE, T. G., JERVIS, R. E.: A particle-size specific elemental mass balance for the apportionment of ambient aerosol, 243

QIU, Q., *see* NOZAKI, T., 47

ROBAYE, G., *see* ROELANDTS, I., 453

ROELANDTS, I., MONTY, C. L. V.: Rare-earth elements in recent calcareous benthic organisms, 531

ROELANDTS, I., ROBAYE, G., WEBER, G., DELBRQUCK, J. M., DUCHESNE, J. C.: Determination of fluorine by proton-induced gamma-ray emission (PIGE) spectrometry in igneous and metamorphic rocks from Rogaland (S. W. Norway), 453

ROOS, DE, C., *see* DE ROOS, C., 199

ROSSBACH, M., *see* LINDSTROM, R. M., 321

ROUCHAUD, J. C., *see* FEDOROFF, M., 395

SABBIONI, E., PIETRA, R., EDEL, J., GOETZ, L.: The role of neutron activation analysis and radioanalytical methods in dose-effect relationship studies for the setting of trace metal protection criteria, 109

SABBIONI, E., *see* GALLORINI, M., 125

SALBU, B.: Size fractionation techniques combined with INAA for speciation purposes, 169

SAMOSYUK, V. N., *see* FEDOROFF, M., 395

SCHRÖDER, U., *see* ANDERS, B., 285

SHEPHERD, L., *see* MITCHELL, J. W., 425

SHIRAKAWA, M., *see* KOYAMA, M., 489

SPYCHALA, M., MICHAELIS, W., FANGER, H.-U.: Prompt gamma-ray NAA for multi-element determination in sediment samples, 331

SPYROU, N. M., KUSMINARTO, NICOLAOU, G. E.: 2-D reconstruction of elemental distribution within a sample using neutron capture prompt gamma-rays, 57

SPYROU, N. M., *see* AL-MUGRABI, M., 277

STARÝ, J.: Rapid separation of mercury, arsenic, thallium and chromium species, 119

STOSCH, H.-G., HERPERS, U., KÖTZ, J.: NAA of rare earth elements in rocks from the earth's upper mantle and deep crust, 545

STONE, S. F., HANCOCK, D., ZEISLER, R.: Characterization of biological macromolecules by electrophoresis and neutron activation 95

STRIJCKMANS, K., *see* WAUTERS, G., 23

STROUBE, W. B., Jr., CUNNINGHAM, W. C., LUTZ, G. J.: Analysis of foods for iodine by epithermal NAA, 341

SUZUKI, N., MIURA, K., NAKAMURA, S.: Substoichiometric radioactivation analysis for ytterbium, 555

TAKADA, J., *see* KOYAMA, M., 489

TAKEUCHI, T., NAKANO, Y., AOKI, A., OHMORI, S., TSUKATANI, T.: Comparisons of elemental concentrations in hair of the inhabitants of heavy metal polluted areas with those of normal Japanese, 259

TOBLER, L., *see* PETERSON, M. L., 515

TREBERT HAEBERLIN, S., *see* LUX, F., 161

TSUKATANI, T., *see* TAKEUCHI, T., 259

VAN ASSEMA, R., *see* DE BRUIN, M., 199

VANDECASTEELE, C., *see* WAUTERS, G., 23

VANNUCCI, R., *see* MELONI, S., 507

VAN WIJK, P. M., *see* DE BRUIN, M., 199

VOGEL, W., *see* ANDERS, B., 285

WAINERDI, R. E.: Professor Emile A. Schweikert presented with the Hevesy Medal for 1986, 7

WÄNKE, H., *see* ENGLERT, P., 11

WAUTERS, G., VANDECASTEELE, C., STRIJCKMANS, K., HOSTE, J.: Determination of cadmium, thallium and lead in environmental samples by proton activation analysis, 23

WEBER, G., *see* ROELANDTS, I., 453

WIJK, VAN, P. M., *see* VAN WIJK, P. M., 199

WU, C. Y., CHEN, P. Y., YANG, M. H.: Simultaneous determination of arsenic, mercury, antimony and selenium in biological materials with prior collection of gaseous products followed by NAA, 133

WYTTENBACH, A., *see* PETERSON, M. L., 515

YANG, M. H., *see* WU, C. Y., 133

YEGNASUBRAMANIAN, S., *see* MITCHELL, J. W., 425

YOUNG, R. C., III *see* EHMANN, W. D., 71

ZEISLER, R., *see* LINDSTROM, R. M., 321

ZEISLER, R., *see* STONE, S. F., 95

ZHUANG, G. S., *see* HUANG, K. S., 193